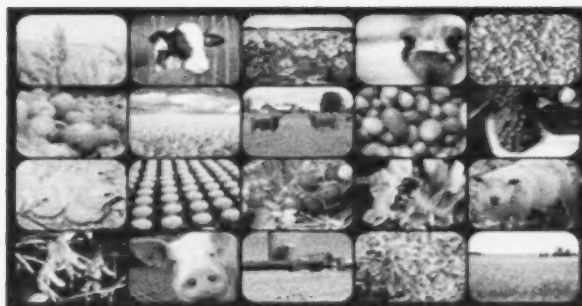


**Leveraging technology
and market opportunities
in a diverse horticulture industry**



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- ^p preliminary
- ^r revised
- x suppressed to meet the confidentiality requirements of the *Statistics Act*
- ^E use with caution
- F too unreliable to be published
- * significantly different from reference category ($p < 0.05$)

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Leveraging technology and market opportunities in a diverse horticulture industry

Operators in the horticulture sector continued to look for innovative ways to grow products and meet market demands. The use of technology and marketing have allowed some agricultural sectors to adapt to changes in the agriculture industry. Several sectors reported increases in area on the 2016 Census of Agriculture including greenhouse vegetable production (22.5%), fruits, berries and nuts production (6.7%) and field vegetable production (1.0%). The increases were due, in part, to the use of technology and marketing. Maple syrup production also benefited from the adoption of technologies, such as reverse osmosis.

Horticulture operation types are a mixed variety across Canada

Based on total gross farm receipts, fruit and tree nut type operations were the most prevalent in the horticulture sector in 4 of the 10 provinces in 2015 (Table 1). Greenhouse vegetable type operations were the largest horticulture operation type in Ontario, in terms of gross farm receipts, with over \$878.4 million. In Alberta and Saskatchewan beekeeping was the largest horticulture operation type in terms of gross farm receipts. Honeybees produce honey using nectar from crops like canola and alfalfa, both of which have a large presence in Alberta and Saskatchewan. An increase demand for honey coupled with large areas of canola and alfalfa allows beekeepers in these regions to maximize honey production.

Table 1

Largest horticulture operation types by gross farm receipts, by province, 2015

Province	Largest operation type by gross farm receipts	Total gross farm receipts
		dollars (millions)
Newfoundland and Labrador	Greenhouse flowers	7.6
Prince Edward Island	Fruit and tree nut	15.9
Nova Scotia	Fruit and tree nut	96.1
New Brunswick	Fruit and tree nut	56.6
Quebec	Field vegetables	490.3
Ontario	Greenhouse vegetables	878.4
Manitoba	Greenhouse flowers	41.3
Saskatchewan	Beekeeping	36.9
Alberta	Beekeeping	123.4
British Columbia	Fruit and tree nut	478.3

Source: Census of Agriculture (3438).

Small field vegetable operations branching out to local markets

Farm stands and farmers' markets are found across the country, which allows operators to market their products. An increase in the number of farm stands and farmers' markets in Canada has been driven by the increasing demand from consumers to be more in touch with the food they purchase. In turn, smaller vegetable operations are opting for more direct sales to consumers, while larger operations take advantage of their production capacity to obtain the majority of contractual work.

Of operations deriving the majority of gross farm receipts from field vegetables, 56.6% reported selling directly to consumers in 2016. Operations with five or fewer acres of vegetables accounted for over two-thirds of the vegetable type farms (excluding potatoes) reporting direct to consumer sales. Operations reporting more than 100 acres of vegetable area, in turn, comprised 3.4% of the vegetable type farms (excluding potatoes) reporting direct to consumer sales. The direct to consumer method most reported for these farm types was the use of on-farm sales, such as farm stands, kiosks and u-pick, followed by the use of farmers' markets.

Consumer demand for fresh and local food contributed to an increase in marketing opportunities for small producers. Two-thirds of the operations reporting vegetables in 2016 reported five or fewer acres of vegetables, a 19.2% increase in farm numbers since 2011 (Table 2).

Operations reporting more than 100 acres of vegetable area accounted for 6.5% of the total number of operations reporting vegetables, and 67.5% of field vegetable area. The number of operations reporting more than 100 acres of vegetables has remained stable since 2011, while their vegetable area increased 5.2% since 2011. Over the last five years, the area reported by these operations has increased from 173,468 acres to 182,531 acres.

Table 2

Number and percentage of agricultural operations reporting vegetables and total vegetable area and percentage by size class, Canada, 2016

Size class (acres)	Agricultural operations reporting vegetables		Vegetable area	
	number	percent ¹	acres	percent ¹
5.0 or fewer	6,670	66.7	11,017	4.1
5.1 to 25.0	1,634	16.3	19,351	7.2
25.1 to 50.0	552	5.5	20,893	7.7
50.1 to 100.0	493	4.9	36,502	13.5
More than 100.0	645	6.5	182,531	67.5
Total	9,994	100.0	270,294	100.0

1. Totals may not equal 100% due to rounding.

Source: Census of Agriculture (3438).

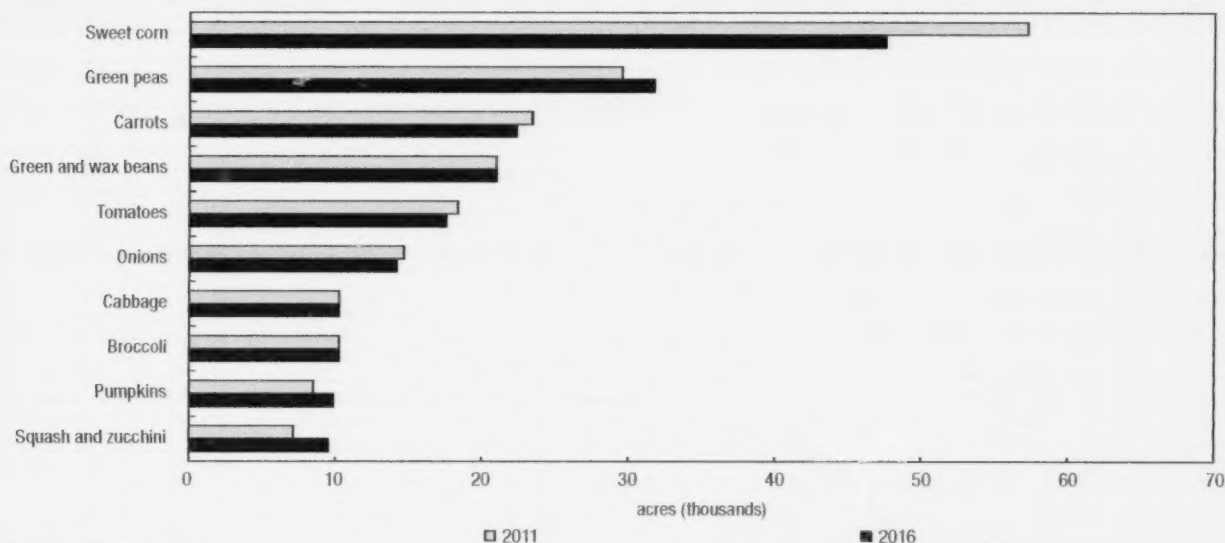
Sweet corn keeps roots in number one field vegetable spot

Canadian vegetables can be destined for fresh or processing markets. Shifting consumer preferences and changes in the processing industry have influenced farmers' production decisions. Total field vegetable area in Canada increased 1.0% since 2011, from 267,665 acres to 270,294 acres in 2016. This rise was the result of an increased demand for field vegetables such as green peas, squash and pumpkins.

Sweet corn decreased 16.9% since 2011. However, it remained the number one vegetable crop, representing 17.6% of the total vegetable area in Canada (Chart 1). The decline in sweet corn is due in part to consolidation changes in the processing industry as well as a decrease in processing contracts. Ontario accounts for nearly half of the country's sweet corn with 48.2%. The Ontario Processing Vegetable Growers reports fewer farms and less area contracted in 2015 than in 2011, and total tons of harvested sweet corn have dropped by over 8% in that time period. Sweet corn has been declining since reaching a high on the Census of Agriculture in 1996, falling 49.2% over the 20-year period, to 47,560 acres in 2016.

Chart 1
Area of selected field vegetables, Canada, 2011 and 2016

Field vegetable



Source: CANSIM table 004-0215.

Ontario remains top vegetable grower

Ontario continued to represent the largest proportion of vegetable area in Canada with 50.1% of the national total, with vegetable area rising 4.5% from 2011 to 135,420 acres in 2016. More than half of the operations in Ontario with vegetable area also reported direct to consumer sales. The use of on-farm sales, such as farm stands, kiosks and u-pick was the top reported method.

Ontario and Quebec dominated in terms of field vegetable acreage accounting for 84.3% of Canada's field vegetable area. The rest of the provinces accounted for the remaining 15.7%, with British Columbia and Alberta having the third and fourth largest areas.

Quebec and Ontario saw the largest increases in the number of operations reporting both vegetables and organic products. For operations reporting vegetables, the proportion that also reported organic products in Quebec rose from 11.8% to 14.0% between 2011 and 2016, while in Ontario the proportion rose from 5.9% to 6.6% over the same period.

Blueberries, cranberries and grapes drive increase in fruits, berries and nuts area

Total fruits, berries and nuts area increased 6.7% since 2011, rising to 332,812 acres in 2016. The majority of the increase in total fruits, berries and nuts area can be attributed to the increase in blueberry area, which grew 12.0% (Table 3). Blueberries accounted for over half of the total fruits, berries and nuts area in Canada at 58.9%, with blueberry production continuing to be concentrated in Quebec, New Brunswick and Nova Scotia.

Mechanized harvesting has allowed some operations growing fruits, berries and nuts to reduce production costs and labour requirements associated with handpicking. Between 2011 and 2016 demand for berries was strong. The total amount of blueberries, both fresh and frozen, exported from Canada increased 44.9% from 91.0 thousand metric tons in 2011 to 131.8 thousand metric tons in 2016. Fresh blueberry exports grew at a greater rate than that of frozen blueberry exports, growing 84.4% from 2011 to 2016 (Statistics Canada. 2017. Special tabulation, based on World Trade Atlas Database, accessed April 13, 2017). The average production of blueberries also increased, from 0.7 tons per acre in 2011 to 1.2 tons per acre in 2016, an increase of 84.7% (CANSIM table 001-0009, accessed April 13, 2017).

The United States remained Canada's top destination for blueberries, accounting for 71.0% of the blueberries exported in 2016, up from 55.3% in 2011. Germany and Japan followed in second and third, accounting for a combined 13.4% in 2016.

Table 3

Number and percentage of agricultural operations reporting fruits, berries and nuts and total area and percentage for selected fruits and berries, Canada, 2016

Fruit or berry	Agricultural operations reporting fruits, berries and nuts		Fruits, berries and nuts area	
	number ¹	percent of total ²	acres	percent of total
Blueberries	3,922	31.8	196,026	58.9
Apples	3,835	31.1	43,631	13.1
Grapes	2,036	16.5	31,241	9.4
Cranberries	280	2.3	18,134	5.4
Strawberries	2,144	17.4	10,155	3.1
Peaches	911	7.4	6,590	2.0
Raspberries	2,391	19.4	5,651	1.7
Sweet cherries	1,324	10.7	5,420	1.6
Sour cherries	574	4.7	2,603	0.8

1. The "number of agricultural operations" reporting does not equal the sum of the parts because agricultural operations reporting more than one category (or activity) are only counted once.

2. Percentage of operations reporting selected fruit and berry types may be higher than 100%, as operations can report multiple fruit, berry and nut types for the same operation.

Source: CANSIM table 004-0214.

Total apple area in Canada decreased by 1,449 acres since 2011 to 43,631 acres in 2016. While area of production declined, the area is used more intensively. Since 1996, the yield of apples in Canada has increased from 7.2 tons per acre to 10.0 tons per acre (CANSIM table 001-0009, accessed April 13, 2017). This is due in part to new planting systems and techniques, such as the use of dwarf apple trees. These trees are easier to maintain, prune and harvest, and require less space than standard trees. In addition, these trees are quicker to come into production allowing operators to grow new varieties, such as Ambrosia, to keep pace with consumers' changing preferences.

An increase in grapes used mostly for wine contributed to a 4.1% increase in total grape area across Canada, as did high price margins which helped offset higher labour costs in the industry. The success of Canadian ice wine on international markets, as well as the increased production of higher-valued grapes, stimulated the market. Since 2011, the average farm gate value per acre of grapes has increased 14.4% to \$4,900 in 2016 (CANSIM table 001-0009, accessed April 13, 2017). Ontario and British Columbia continued to lead in total grape area, with Ontario accounting for 59.9% of Canada's total and British Columbia for 30.9%.

Cranberries maintained the fourth-largest fruits, berries and nuts area in Canada in 2016, increasing 19.4%. Quebec continued to account for the largest cranberry area with 54.5% of Canada's total. Exports of fresh cranberries also increased between 2011 and 2016, growing 77.6% to 63.5 thousand metric tons in 2016 (Statistics Canada. 2017. Special tabulation, based on World Trade Atlas Database, accessed April 13, 2017). Like blueberries, cranberries can be mechanically harvested making them more appealing than other berries that require hand harvesting.

Strawberries and raspberries both decreased in total area since 2011, in response to disease outbreaks, labour shortages and market challenges. Strawberries decreased 8.4%, while raspberries decreased 23.7%.

Operations reporting fruits, berries and nuts have also benefited from the use of farm stands and farmers' markets to sell products directly to consumers. Of farms deriving the majority of gross farm receipts from fruits, berries and nuts, 37.8% reported selling directly to consumers. Similar to vegetable operations, the direct to consumer method most reported was the use of on-farm sales, such as farm stands, kiosks and u-pick, followed by the use of farmers' markets.

Greenhouse area expands with year-round vegetable demand

Demand for fresh vegetables year-round continued to drive growth in greenhouse vegetables. Total greenhouse area used to produce vegetables increased 22.5% from 135.1 million square feet in 2011 to 165.4 million square feet in 2016. Greenhouse, Sod and Nursery Survey data confirm the increase in greenhouse vegetable growth as

greenhouse cucumber production (in pounds) rose 16.7%, and greenhouse pepper production (in pounds) rose 50.7% between 2011 and 2016 (CANSIM table 001-0006, accessed May 10, 2017).

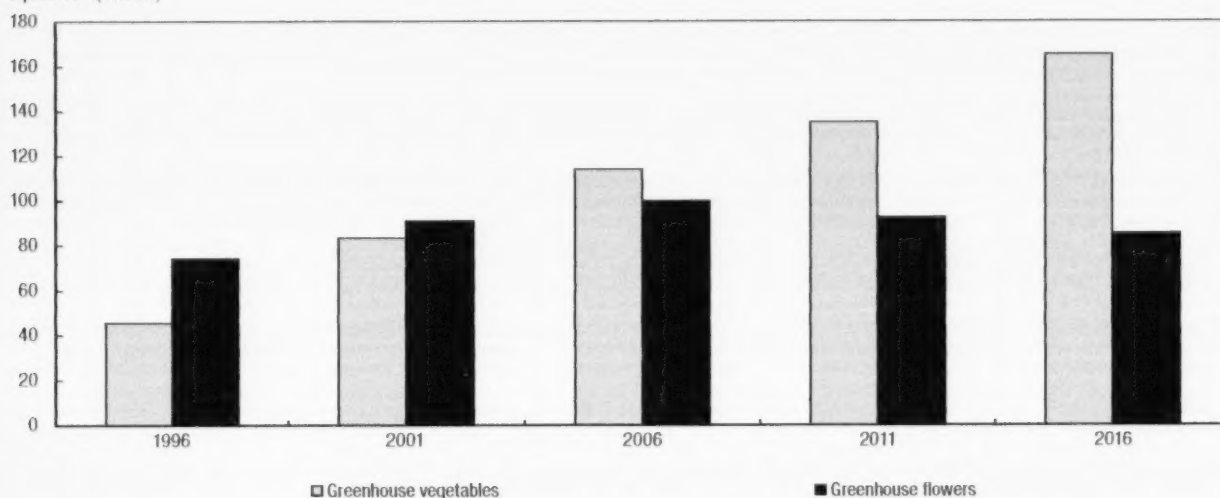
Greenhouse area used to produce flowers decreased by 7.7%, most notably in Ontario, dropping 2.9 million square feet, and in Quebec, where area fell by 2.7 million square feet. A rise in the number of flowers imported into Canada from countries like Colombia and Ecuador have contributed to a decrease in Canada's flower production, with the value of imported flowers from these countries increasing from 2011 to 2016. This has led to a shift across Canada from greenhouse flower production to greenhouse vegetable production.

Over the last 50 years, the average total area under glass per agricultural operation has nearly quadrupled, from over 15,000 square feet compared to just under 58,000 square feet. Greenhouse area for flower and vegetable production continued to be situated primarily in Ontario (60.4%), British Columbia (21.1%) and Quebec (10.0%). Greenhouse vegetable area was nearly double that of greenhouse flower area, 165.4 million square feet versus 85.4 million square feet. Since 1996, greenhouse vegetable area has more than tripled, increasing 265.2%. Greenhouse flower area continued to decline after reaching its peak of 99.9 million square feet in 2006 (Chart 2).

Chart 2

Area of greenhouse vegetables and greenhouse flowers, Canada, 1996 to 2016

square feet (millions)



Source: Census of Agriculture (3438).

Nearly one in three greenhouse operations in Canada reported using greenhouse automation technology. Those reporting greenhouse automation had facilities that were over nine times larger, on average, than those not reporting the use of this technology (just over 152,400 square feet compared to just over 16,600 square feet). The use of greenhouse automation is one example of the various innovative methods that greenhouse operations utilize. Irrigation systems, solar heating, and wood boiler heaters are other methods used to cut down on operating costs and allow operations to run more efficiently.

Prairie Provinces buzzing with beekeepers

Operators reported 772,652 colonies of honeybees in 2016, up 37.7% since the 2011 Census. Two-thirds of all honeybee colonies reported are located in the Prairie Provinces (Table 4). While honeybees are used primarily to produce honey, they are also used to pollinate crops such as berries, vegetables and hybrid canola. The demand for honey and pollination services led to an increase in the number of honeybee colonies since 2011. A mild winter in 2015/2016 resulted in a lower overwintering loss of colonies.

The number of operations reporting honeybees increased 48.9% since 2011. Of the operations that reported honeybees, 14.9% (those reporting more than 100 colonies) accounted for 92.7% of the honeybee colonies in Canada.

Direct to consumer sales were reported by 62.8% of apiculture (beekeeping) agricultural operation types. The most commonly reported method was on-farm sales, such as farm stands and kiosks.

Table 4

Number and percentage of agricultural operations reporting honeybees and total number and percentage of colonies by province, Canada, 2016

Province	Agricultural operations reporting honeybees		Colonies	
	number	percent ¹	number	percent ¹
Newfoundland and Labrador	8	0.2	355	0.0
Prince Edward Island	36	0.7	5,735	0.7
Nova Scotia	168	3.4	22,118	2.9
New Brunswick	116	2.4	26,618	3.4
Quebec	519	10.7	63,752	8.3
Ontario	1,504	30.9	86,083	11.1
Manitoba	394	8.1	107,857	14.0
Saskatchewan	374	7.7	101,543	13.1
Alberta	708	14.5	304,846	39.5
British Columbia	1,044	21.4	53,745	7.0
Canada	4,871	100.0	772,652	100.0

¹ Totals may not equal 100% due to rounding.

Source: CANSIM table 004-0229.

Other bees exclusively used for pollination, such as leaf-cutter bees, increased 4.9% in 2016, to 372,474 gallons in Canada. Leaf-cutter bees are primarily used for pollinating alfalfa and hybrid canola. This is why Alberta (53.7%), Saskatchewan (26.3%) and Manitoba (15.9%) accounted for 95.8% of the total gallons of pollinating bees reported in Canada. Increases in honeybees and pollinating bees have been noted at the same time as a 6.9% increase in Canada's total cropland, with notable growth in the Prairie Provinces.

Quebec in a sweet spot with maple

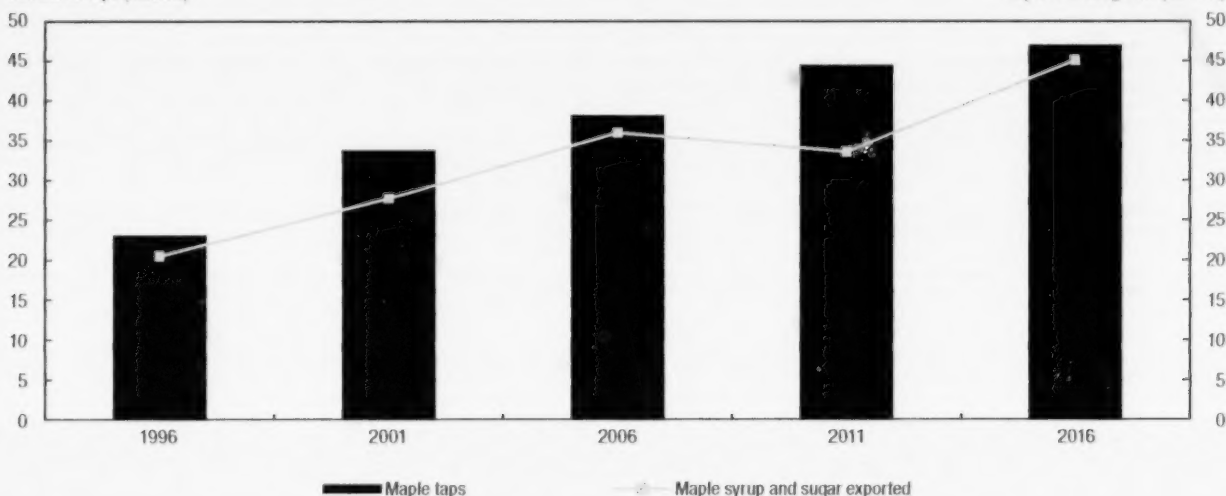
The number of maple taps in Canada increased 5.8% since the 2011 Census, to 47.0 million. Quebec continued to dominate in this commodity, accounting for 90.5% of the country's total in 2016. The use of reverse osmosis, vacuum lines and solar powered monitoring systems are examples of innovation aimed at increasing efficiency.

Canada has the largest number of maple taps in the world, with 47.0 million taps, followed by the United States, which reported a total of 11.4 million taps on the most recent U.S. Census of Agriculture in 2012. A large portion of the maple syrup and maple sugar produced in Canada is exported across the globe. As maple syrup production continued to grow, the amount of exported maple syrup and sugar also increased (Chart 3). In the last 20 years, maple taps have increased 104.1%, while the kilograms of exported maple syrup and sugar have more than doubled, rising 119.9%.

Chart 3**Total maple taps and total maple syrup and sugar exported, Canada, 1996 to 2016**

number of taps (millions)

exports in kilograms (millions)



Sources: CANSIM tables 004-0009 and 004-0220 and Canadian International Merchandise Trade Database table 980-0017 (accessed April 13, 2017).

Decrease in mushroom area

Total mushroom area in Canada decreased 18.6% since 2011, dropping to 6.1 million square feet in 2016. This decrease in area can be attributed, in part, to labour constraints within the industry.

Despite the decrease in mushroom area the total value of mushrooms increased from just over \$2,900 per ton in 2011 to over \$3,500 per ton in 2015 (CANSIM table 001-0012, accessed April 13, 2017). The exporting of various mushroom varieties to Asia has helped stimulate the mushroom market.

Ontario continued to account for the largest share of mushroom area, with 3.2 million square feet, while British Columbia reported another 2.3 million square feet. Together, these two provinces accounted for 89.9% of Canada's total mushroom area.

Sod and nursery industries decline with shift away from single-detached dwellings

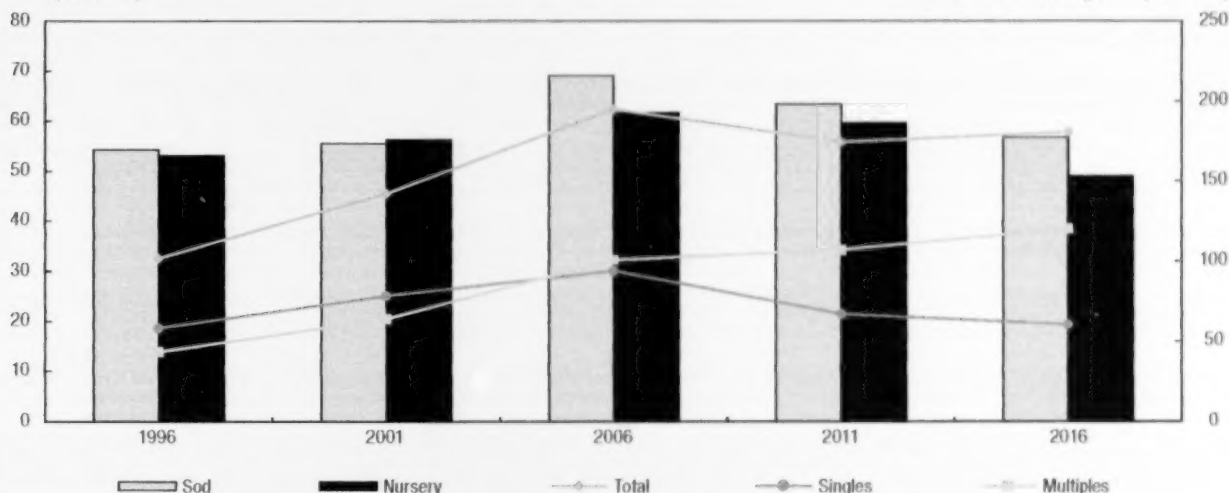
Sod area in Canada decreased 10.6% from 2011, to 56,719 acres in 2016. Nursery area in Canada declined 17.8%, to 49,073 acres over the same time period.

Sod and nursery products are used for landscaping purposes and therefore are associated with the housing sector. The shift from single detached dwellings to multi-dwelling housing types, such as row-houses, semi-detached, and condos contributed to the decrease in demand for sod and nursery products. A multi-dwelling would typically require a greater building footprint than a single-detached dwelling, in turn, leaving less area on the building lot for landscaping. While the rise in multi-dwelling type housing starts resulted in a 3.6% overall increase in new housing starts between 2011 and 2016, the shift in housing types resulted in smaller yard areas, and therefore impacted demand for sod and nursery products (CANSIM table 027-0001, accessed April 13, 2017). A shift from landscaped yards to hardscaped (patios, rock gardens, water features, etc.) has also impacted nursery and sod production.

Chart 4**Total sod and nursery area and total new housing starts, with single dwellings and multiple dwellings, Canada, 1996 to 2016**

acres (thousands)

number of new housing starts (thousands)



Sources: Census of Agriculture (3438) and CANSIM table 027-0001 (accessed April 13, 2017).

From pine to plastic

The Christmas tree industry continued to face difficulties with consumers shifting away from fresh-cut Christmas trees to artificial trees. In 2016, artificial Christmas trees imported to Canada valued \$60.9 million, an increase of 29.3% since 2011, when total imports of artificial Christmas trees was \$47.1 million (Statistics Canada, 2017, Special tabulation, based on World Trade Atlas Database, accessed April 13, 2017). The total Christmas tree area in Canada decreased 11,188 acres since 2011 to 58,780 acres in 2016. Quebec continued to be the largest producer of Christmas trees in Canada, accounting for 34.7% of Canada's total, despite seeing a 229-acre decrease. Nova Scotia remained second with 26.0%.

Note to readers

In 2016, tree seedlings grown solely for reforestation purposes were removed from the Census of Agriculture to standardize with industrial classification methodology. This is a change to the Census of Agriculture as values from previous census years included tree seedlings used for reforestation, while 2016 values do not. The decrease in nursery area was partially due to this change. If the same definition and concepts had remained for 2016 a decline in nursery area would still be evident, however the decrease would be reduced.

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